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                                             Ridgewood NJ   07450

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14. ABSTRACT

The Valley Hospital of Ridgewood, New Jersey, is proposing to extend a limited but highly successful specimen management system. The system utilizes barcodes and handheld technology at the patient's bedside.
In addition The Valley Hospital looks to expand this success by implementing electronic medication administration and transfusion systems which function with the same technology as the specimen collection system.

15. SUBJECT TERMS
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INTRODUCTION

The program designed to reduce specimen collection, medication administration and transfusion errors at The Valley Hospital is rooted in utilization of bar-code technology in tandem with the use of handheld personal data terminals to create a positive identification system at the point of care. Presently, the specimen collection system is operational on 6 nursing units including the Emergency department. The bedside medication verification system is operating on 5 units and will provide the venue for the research in this study. The transfusion module originally slated for a June 2006 implementation has been deferred to December 2007. Sweeping software enhancements needed to be made by the vendor before the system could be worthy of a trial.

The purpose of this study (Phase II of the project) is to examine active errors to determine the contribution of human and technological factors and ascertain if latent errors have been inadvertently introduced. Active errors will be measured by observing staff performing specimen collection, medication administration, and blood transfusion administration. Rule-based procedures have been developed to teach the staff correct processes for implementing the new technology. The rule-based procedure is a check list that sequentially lists each step needed to safely and appropriately complete the procedures.

Data analysis will lead to changes in the rules or validate the rule-based procedures developed during Phase I of this project. Analysis of active error data will include human and technologic factors which can cause errors, resulting from using the proposed technology

Once piloted, revised, and validated, the rule-based procedures would serve as best practice models to reduce and/or eliminate medical errors, for the implementation of the electronic bar-coding system institution wide, for specimen collection, medication administration, and blood transfusion administration.

The aim of this study is to explore and understand latent and active errors that are generated from human interaction with technology processes. Validating the rule-based procedures will identify and eliminate the latent errors with the development of a

standard of care that will maximize patient safety. Since practice patterns may have a wide variation depending on the specialty care unit, data will be collected using direct observation procedures and during ongoing team rounds as the technology is implemented on each unit. The goal of these continued observations and team rounds are to determine if one universal rule-based procedure is appropriate or if customization is needed to ensure proper implementation of the technology. Should customization be required, specific clinical procedures would be written. The level of customization would be carefully examined as lack of standardization is known to introduce errors for staff that work across many areas. The validated rule-based procedures will then function as protocols for use when the institution wide implementation of the electronic bar-coding system is completed for specimen collection, medication administration, and blood transfusion administration

BODY OF WORK

A review of the work accomplished during the period of performance between 12 April 2007 and 11 April 2008 is described in this document.

During this period of performance, the inpatient Oncology unit was brought live on the medication administration system. Between this unit and new nursing personnel 182 nurses were trained to use the system. In this period of performance 109 observations were made and additional 37 subjects were consented. The research with the bedside medication administration system has revealed an increase of near miss occurrences reported by the nurse generated when the pharmacist interprets the medication order either incorrectly or different from the nurse. As a result of these findings the following actions have been taken: A nurse has joined the pharmacy staff to work as a liaison between the pharmacist and the nurse to improve communication between these two disciplines. The liaison shares each prospective with the other. In so doing, it helps the RN and RP to process the order with fewer questions and greater accuracy. During training sessions pharmacists have joined the nurses, particularly those that will be working together. Prior to training a review of the patient's pharmacy medication profile has been compared to the nursing medication administration record. The variation between the two documents have revealed opportunities for software changes, order processing changes for the pharmacist as well as documentation changes for the nurse. These efforts have resulted in a significant decrease in near miss occurrences as well as a 50% decrease in RN learning curve post go live. Post go live of the first 3 units the learning curve was approximately 10-12 weeks to reach proficiency after the modifications were made the learning curve was hastened to 6 weeks.

Accuracy with specimen collection system consistently remains at a rate of 99.98%. The software design of the system is so robust and user friendly that caregivers accept the process and rarely work around it. During this period of performance, 189 new employees were trained on the system.

After many interactions with the software vendor to rewrite software functionality with the transfusion module, redesign was finally reached late in 2007 sufficient to do testing. The pilot unit chosen performs the greatest number of transfusions. The twelve nurses

running the unit were trained on the system. Six subjects were consented and 34 observations were made. After 30 days of trial of the system the only task that could be accomplished with success was the scanning of the patient's bar-code wristband and the barcode on the unit of blood. The system was brought down and once again returned to the vendor to make significant necessary enhancements before the institution is willing to bring it back to the live environment.o

KEY RESEARCH ACCOMPLISHMENTS

Technical Components

- **Specimen Collection System**

    Maintenance and replacement (when necessary) of system equipment.

    Train new employees on the system

- **Beside Medication Verification System**

    Train nurses on inpatient oncology unit

    Implementation of impatient Oncology unit go-live March 2008

    Order equipment, assess workflow and make necessary training alterations

    in preparation for P W2 go live May 2008

Training Program

    Specimen Collection System

- 228 RNs have been trained to use the system

- 33 Patient Care Associates have been trained to use the system

    Bedside Medication Verification System

- 182 RNs have been trained to use the system

Human Use Protocol

- 88 participants consented for the specimen collection system

- 30 participants consented for the bedside medication verification system

- 6 participants consented for the transfusion system